



itl boulder

THE LIGHT CENTER OF THE INDUSTRY SINCE 1955



NVLAP LAB CODE: 200925-0

INDEPENDENT TESTING LABORATORIES, INC.
4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

REPORT NUMBER: ITL81901

PAGE: 1 OF 9

ISSUE DATE: 06/30/14

PREPARED FOR: BOYD LIGHTING COMPANY

CATALOG NUMBER: C46002

LUMINAIRE: FABRICATED METAL HOUSING WITH BLACK PAINTED GENERAL INTERIOR FINISH. FORMED METAL REFLECTOR WITH PREMIUM SPECULAR FINISH, FLAT DIFFUSE METAL CIRCUIT BOARD MOUNT, 2 CIRCUIT BOARDS WITH A TOTAL OF 45 LEDS, FABRICATED WHITE PAINTED METAL LENS MOUNTING BRACKETS. CLEAR FLAT 1/4" THICK GLASS LENS WITH SILVER BACKING, BACKING HAS 91 RECTANGULAR CUTOUTS MEASURING APPROXIMATELY 1/4" X 2 1/4", CUTOUTS HAVE WHITE FIBROUS INTERIOR OVERLAY, TWO FABRICATED SEMI-DIFFUSE METAL MOUNTING BRACKETS.

LAMPS: FORTY-FIVE WHITE LIGHT EMITTING DIODES (LEDS), AIMED AT THE HORIZON.

TOTAL INPUT WATTS = 44.7 AT 120.0 VOLTS

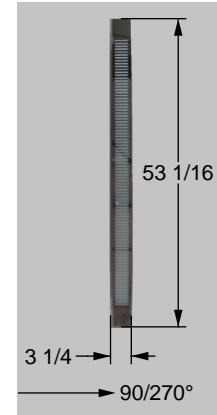
MOUNTING: WALL

LED DRIVER: OSRAM OT48W/PRG2000C/UNV/DIM/L, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST, CLIENT STATES DRIVER PROGRAMMED FOR 2000mA OUTPUT.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER.

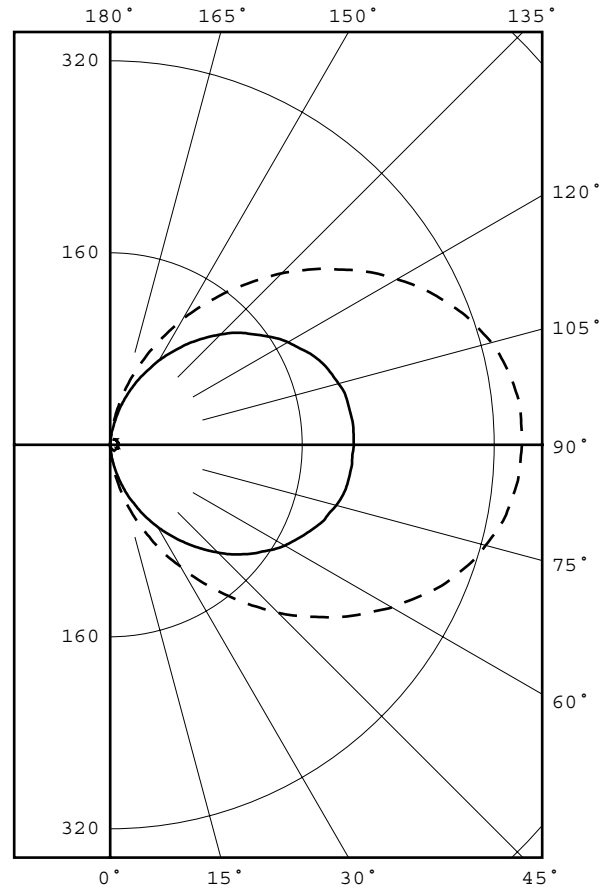
TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET



CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	0	0	0	0	0	0
5	9	6	1	1	0	5
15	48	31	3	2	1	14
25	94	63	5	4	2	29
35	144	95	6	6	2	48
45	198	127	6	7	1	68
55	248	155	6	9	0	87
65	292	178	6	11	0	101
75	324	195	7	11	0	108
85	341	202	6	11	0	109
90	343	203	6	10	0	102
95	343	203	6	11	0	88
105	329	197	6	12	0	69
115	297	182	7	11	0	49
125	253	158	6	9	0	30
135	202	130	6	8	1	14
145	147	97	6	6	2	5
155	94	64	4	4	2	0
165	47	32	3	2	1	
175	9	6	1	1	0	
180	0	0	0	0	0	



LEGEND:
0-deg -----
45-deg =====
90-deg -----

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	19	2.1
0- 40	48	5.2
0- 60	164	17.7
0- 90	460	49.7
90-120	299	32.3
90-130	368	39.7
90-150	447	48.2
90-180	467	50.3
0-180	927	100.0

EFFICACY = 20.7 lm/W

CIE TYPE - GENERAL DIFFUSE

Checked
Approved
Lighting Engineer



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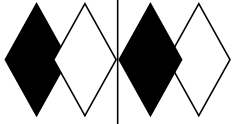
REPORT NUMBER: ITL81901
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PREPARED FOR: BOYD LIGHTING COMPANY

PAGE: 2 OF 9

PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 0.250 3.250
HEIGHT OF SIDE : 53.063 53.063

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	2505.	2107.	934.
55	2712.	2224.	821.
65	2889.	2311.	752.
75	3011.	2379.	833.
85	3075.	2392.	700.



REPORT NUMBER: ITL81901

PAGE: 3 OF 9

ISSUE DATE: 06/30/14

PREPARED FOR: BOYD LIGHTING COMPANY

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	112.5	135.0	157.5
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	2	2	2	2	2	1	1	1	0	0	0	0	0	0
5.0	9	9	8	8	7	6	4	3	2	1	1	1	1	1
7.5	17	17	16	15	13	11	8	6	3	2	1	1	1	1
10.0	27	26	25	24	21	17	13	9	5	3	2	2	2	1
12.5	37	37	35	33	29	24	19	13	7	3	3	3	2	2
15.0	48	47	45	43	37	31	24	16	9	4	3	3	2	2
17.5	59	58	56	53	46	39	30	21	12	5	4	3	3	2
20.0	70	69	67	63	56	47	36	25	14	6	4	4	3	2
22.5	81	81	78	73	64	54	42	29	17	6	4	4	4	3
25.0	94	93	90	84	74	63	49	34	19	7	5	5	4	3
27.5	106	105	102	95	84	71	55	38	22	8	5	5	4	3
30.0	117	118	114	106	94	79	61	43	24	9	5	5	5	4
32.5	131	130	126	118	104	87	68	47	27	9	5	5	5	4
35.0	144	143	139	129	114	95	74	51	29	10	6	6	6	4
37.5	157	157	151	141	124	103	80	56	32	11	6	6	6	4
40.0	171	170	164	153	134	111	86	60	34	11	6	6	7	5
42.5	184	184	177	164	144	119	92	64	36	12	6	7	7	5
45.0	198	197	190	176	154	127	98	68	39	12	6	7	7	5
47.5	211	210	202	187	163	135	104	72	41	13	6	7	8	5
50.0	223	223	214	198	172	142	109	76	43	14	6	8	8	5
52.5	236	235	226	208	181	149	114	79	45	14	6	8	9	5
55.0	248	247	238	218	190	155	118	82	46	15	6	8	9	5
57.5	259	259	249	228	198	162	123	84	48	15	6	8	9	5
60.0	271	270	259	237	206	168	127	86	49	15	6	8	10	5
62.5	281	281	269	246	213	173	131	89	50	15	7	9	10	5
65.0	292	291	279	254	220	178	134	91	51	16	6	9	11	5
67.5	302	301	288	262	226	183	138	93	52	16	7	9	11	5
70.0	310	309	296	268	232	188	141	94	52	16	6	9	11	4
72.5	318	317	303	275	237	191	143	96	53	16	7	10	11	5
75.0	324	323	309	280	241	195	145	97	53	16	7	10	11	4
77.5	330	329	314	285	245	198	147	98	53	16	7	10	11	4
80.0	335	334	319	289	248	200	148	98	53	16	7	10	11	4
82.5	338	337	322	292	250	201	149	98	53	16	6	9	11	4
85.0	341	340	324	294	252	202	149	98	53	15	6	9	11	4
87.5	342	341	326	295	252	202	149	98	52	15	6	9	10	4
90.0	343	342	326	296	253	203	149	98	52	15	6	9	10	4
92.5	343	342	326	296	253	203	150	98	52	15	6	9	10	4
95.0	343	341	326	295	253	203	150	99	53	15	6	9	11	4
97.5	341	339	324	294	252	202	150	99	53	16	7	10	11	4
100.0	338	336	321	292	250	201	149	99	54	16	7	10	11	4
102.5	334	332	318	288	248	200	148	98	53	16	7	10	11	4
105.0	329	327	313	284	245	197	147	98	53	16	6	10	12	4
107.5	322	321	307	279	241	194	145	97	53	16	7	10	12	4
110.0	315	314	300	273	236	191	143	96	53	16	7	9	11	5
112.5	306	305	293	266	230	187	140	94	52	16	7	9	11	5
115.0	297	296	284	258	224	182	136	92	51	16	7	9	11	5
117.5	287	286	274	251	217	176	133	90	50	16	7	9	10	5
120.0	276	275	265	241	210	171	129	88	50	15	7	9	10	5
122.5	265	264	254	232	202	165	125	86	48	15	6	8	10	5
125.0	253	252	243	222	194	158	121	83	47	15	6	8	9	5
127.5	240	240	231	212	185	151	116	80	45	14	6	8	9	5
130.0	228	228	219	202	176	145	112	77	44	14	7	8	9	5
132.5	215	215	207	191	167	138	106	73	42	13	6	7	8	5
135.0	202	202	195	180	158	130	100	70	40	13	6	7	8	5
137.5	188	188	182	168	147	122	94	65	37	12	6	7	7	5
140.0	174	174	169	156	137	114	88	61	35	11	6	6	7	5
142.5	161	161	156	144	127	106	82	57	32	11	6	6	6	4
145.0	147	147	143	132	117	97	76	53	30	10	6	6	6	4
147.5	134	134	130	120	107	89	69	48	27	9	5	5	5	4
150.0	121	121	117	109	96	81	63	44	25	8	5	5	5	3
152.5	107	107	104	97	86	72	56	39	22	8	5	5	4	3
155.0	94	94	92	86	76	64	50	35	20	7	4	4	4	3
157.5	82	82	80	75	66	56	44	30	17	6	4	4	3	2



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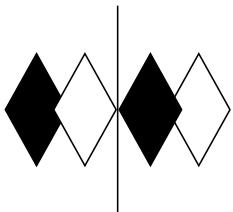
PAGE: 4 OF 9

ISSUE DATE: 06/30/14

PREPARED FOR: BOYD LIGHTING COMPANY

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	112.5	135.0	157.5
160.0	69	69	68	64	57	48	37	26	14	5	4	3	3	2
162.5	58	57	56	53	47	40	31	21	12	5	3	3	3	2
165.0	47	46	45	43	38	32	25	17	9	4	3	3	2	1
167.5	35	34	34	32	28	24	19	13	7	3	2	2	2	1
170.0	24	24	23	21	19	16	13	9	5	2	2	2	2	1
172.5	13	16	15	13	12	11	8	6	3	2	1	1	1	1
175.0	9	8	8	7	7	6	4	3	2	1	1	1	1	1
177.5	2	3	2	2	3	2	2	1	1	1	1	1	1	1
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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PAGE: 5 OF 9

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CANDELA DISTRIBUTION
 LATERAL ANGLE

180.0	
0.0	0
2.5	0
5.0	0
7.5	0
10.0	1
12.5	1
15.0	1
17.5	2
20.0	2
22.5	2
25.0	2
27.5	2
30.0	2
32.5	2
35.0	2
37.5	2
40.0	2
42.5	1
45.0	1
47.5	1
50.0	1
52.5	1
55.0	0
57.5	0
60.0	0
62.5	0
65.0	0
67.5	0
70.0	0
72.5	0
75.0	0
77.5	0
80.0	0
82.5	0
85.0	0
87.5	0
90.0	0
92.5	0
95.0	0
97.5	0
100.0	0
102.5	0
105.0	0
107.5	0
110.0	0
112.5	0
115.0	0
117.5	0
120.0	0
122.5	0
125.0	0
127.5	0
130.0	1
132.5	1
135.0	1
137.5	1
140.0	2
142.5	2
145.0	2
147.5	2
150.0	2
152.5	2
155.0	2
157.5	2



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PAGE: 6 OF 9

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CANDELA DISTRIBUTION
 LATERAL ANGLE

	180.0	
160.0		1
162.5		1
165.0		1
167.5		1
170.0		1
172.5		1
175.0		0
177.5		0
180.0		0



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PAGE: 7 OF 9

ISSUE DATE: 06/30/14

PREPARED FOR: BOYD LIGHTING COMPANY

5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	0
5- 10	0
10- 15	1
15- 20	3
20- 25	6
25- 30	9
30- 35	12
35- 40	17
40- 45	21
45- 50	26
50- 55	32
55- 60	36
60- 65	41
65- 70	46
70- 75	49
75- 80	52
80- 85	54
85- 90	54
90- 95	55
95-100	54
100-105	52
105-110	50
110-115	46
115-120	42
120-125	37
125-130	32
130-135	27
135-140	22
140-145	17
145-150	13
150-155	9
155-160	6
160-165	3
165-170	1
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	0
0- 20	5
0- 30	19
0- 40	48
0- 50	96
0- 60	164
0- 70	251
0- 80	352
0- 90	460
0-100	569
0-110	671
0-120	759
0-130	828
0-140	877
0-150	907
0-160	922
0-170	926
0-180	927



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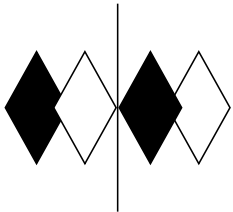
COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0	
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	107	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50
1	92	85	79	73	84	84	77	72	67	64	60	56	51	48	45	40	37	35	29
2	81	71	62	55	73	64	57	50	53	47	41	42	37	33	32	28	25	20	20
3	73	60	51	43	66	55	46	39	44	38	32	35	30	25	26	22	19	14	14
4	65	52	42	35	59	47	38	32	38	31	26	30	25	20	22	18	15	11	11
5	60	46	36	28	54	41	33	26	34	27	21	26	21	16	19	15	12	8	8
6	54	40	31	24	49	37	28	22	30	23	18	23	18	14	17	13	10	6	6
7	50	36	27	20	45	33	24	18	27	20	15	21	15	11	15	11	8	5	5
8	46	32	23	17	42	29	21	16	24	17	13	19	14	10	14	10	7	4	4
9	43	29	21	15	39	27	19	14	22	15	11	17	12	8	13	9	6	3	3
10	40	27	19	13	36	24	17	12	20	14	10	16	11	7	12	8	5	3	3

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

NOTE: THE ZONAL CAVITY CALCULATION TECHNIQUE IS ACCURATE WHEN LUMINAIRES WITH SYMMETRIC CANDELA DISTRIBUTIONS ARE EMPLOYED AND WHEN THE LUMINAIRES ARE LOCATED SYMMETRICALLY THROUGHOUT THE ROOM. THIS UNIT HAS SPECIAL CHARACTERISTICS AND THEREFORE THESE COEFFICIENTS SHOULD BE USED WITH CAUTION.



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PAGE: 9 OF 9

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SUITE 3150
SAUSALITO, CA 94965

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REPORT NUMBER: ITL81900

PAGE: 1 OF 9

ISSUE DATE: 06/27/14

PREPARED FOR: BOYD LIGHTING COMPANY

CATALOG NUMBER: C46001

LUMINAIRE: FABRICATED METAL HOUSING WITH BLACK PAINTED GENERAL INTERIOR FINISH. FORMED METAL REFLECTOR WITH PREMIUM SPECULAR FINISH, FLAT DIFFUSE METAL CIRCUIT BOARD MOUNT, 2 CIRCUIT BOARDS WITH A TOTAL OF 33 LEDS, FABRICATED WHITE PAINTED METAL LENS MOUNTING BRACKETS. CLEAR FLAT 1/4" THICK GLASS LENS WITH SILVER BACKING, BACKING HAS 67 RECTANGULAR CUTOUTS MEASURING APPROXIMATELY 1/4" X 2 1/4", CUTOUTS HAVE WHITE FIBROUS INTERIOR OVERLAY, TWO FABRICATED SEMI-DIFFUSE METAL MOUNTING BRACKETS.

LAMPS: THIRTY-THREE WHITE LIGHT EMITTING DIODES (LEDS), AIMED AT THE HORIZON.

TOTAL INPUT WATTS = 36.7 AT 120.0 VOLTS

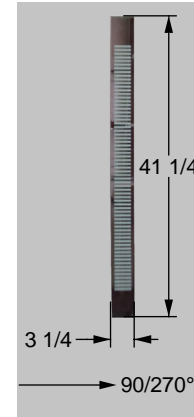
MOUNTING: WALL

LED DRIVER: OSRAM OT48W/PRG2000C/UNV/DIM/L, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST, CLIENT STATES DRIVER PROGRAMMED FOR 1650mA OUTPUT.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER.

TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET



CANDELA DISTRIBUTION

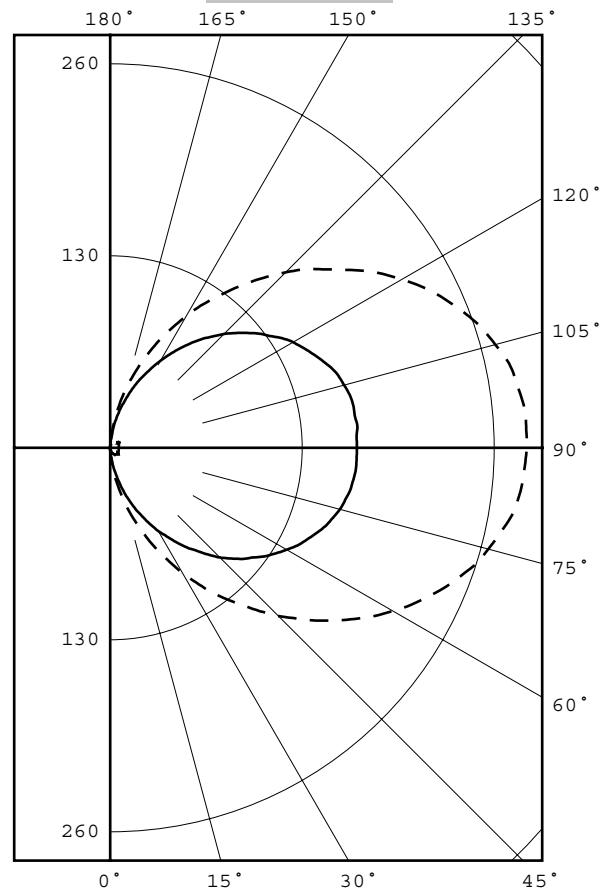
FLUX

	0.0	45.0	90.0	135.0	180.0	
0	0	0	0	0	0	0
5	8	5	1	1	1	0
15	39	25	3	2	1	4
25	77	51	4	3	2	12
35	119	78	6	5	2	24
45	161	105	6	6	2	39
55	202	128	7	7	1	56
65	238	147	7	8	0	71
75	265	161	7	9	0	83
85	280	167	7	8	0	89
90	282	167	7	8	0	
95	282	168	7	8	0	89
105	270	164	7	9	0	84
115	245	151	7	8	0	73
125	209	132	6	7	1	58
135	168	109	6	6	1	41
145	124	82	6	5	2	25
155	82	54	4	3	2	12
165	42	28	3	2	1	4
175	8	5	1	1	0	0
180	0	0	0	0	0	

ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	16	2.1
0- 40	40	5.2
0- 60	135	17.7
0- 90	378	49.4
90-120	246	32.2
90-130	304	39.8
90-150	370	48.4
90-180	387	50.6
0-180	764	100.0

EFFICACY = 20.8 lm/W
CIE TYPE - GENERAL DIFFUSE



LEGEND:
0-deg -----
45-deg - - - - -
90-deg - . - . -

Checked _____
Approved _____
Lighting Engineer



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INDEPENDENT TESTING LABORATORIES, INC.
 4066 CAMELOT CIRCLE, LONGMONT, CO 80504 USA

PHONE: (303) 442-1255 • FAX: (970) 535-3114 • E-MAIL: itl@itlboulder.com • WEBSITE: www.itlboulder.com

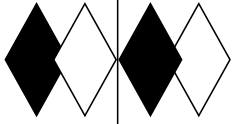
REPORT NUMBER: ITL81900
 ISSUE DATE: 06/27/14
 PREPARED FOR: BOYD LIGHTING COMPANY

PAGE: 2 OF 9

PLANE : 0-DEG 90-DEG
 LUMINOUS LENGTH : 0.250 3.250
 HEIGHT OF SIDE : 41.250 41.250

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	2617.	2237.	1182.
55	2839.	2359.	1217.
65	3028.	2454.	1120.
75	3167.	2525.	1067.
85	3248.	2543.	1049.



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PREPARED FOR: BOYD LIGHTING COMPANY

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	112.5	135.0	157.5
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	2	2	2	2	2	1	1	1	1	1	1	1	1	1
5.0	8	7	7	7	6	5	4	2	2	1	1	1	1	1
7.5	14	14	13	12	11	9	7	5	3	2	1	2	1	1
10.0	22	21	21	19	17	14	11	7	4	2	2	2	2	1
12.5	30	30	29	27	24	19	15	10	6	3	2	3	2	1
15.0	39	39	37	35	30	25	20	13	8	3	3	3	2	2
17.5	48	48	46	43	38	32	24	17	9	4	3	3	2	2
20.0	57	57	55	52	45	38	30	20	12	5	4	3	3	2
22.5	67	67	65	60	53	45	35	24	14	5	4	4	3	2
25.0	77	77	75	69	61	51	40	28	16	6	4	4	3	3
27.5	87	87	84	78	69	58	45	31	18	7	5	5	4	3
30.0	98	98	94	87	77	65	50	35	20	7	5	5	4	3
32.5	108	108	104	96	85	71	55	39	22	8	5	5	4	3
35.0	119	118	115	106	94	78	60	42	24	9	6	5	5	4
37.5	129	129	125	115	102	85	66	46	26	9	6	6	5	4
40.0	139	139	135	125	110	91	71	49	28	10	6	6	6	4
42.5	150	150	145	134	118	98	76	52	30	10	6	6	6	4
45.0	161	161	155	144	126	105	81	56	32	11	6	6	6	4
47.5	171	171	165	153	134	111	86	59	34	11	6	7	6	4
50.0	182	182	175	161	142	117	90	63	35	12	7	7	7	4
52.5	192	191	184	169	148	122	94	65	37	12	6	7	7	4
55.0	202	202	193	177	156	128	98	68	38	13	7	7	7	4
57.5	212	211	203	184	163	133	102	70	39	13	7	7	7	4
60.0	221	220	211	192	168	138	105	72	40	13	7	7	7	3
62.5	230	229	219	199	174	143	108	74	41	14	7	7	8	3
65.0	238	237	227	206	180	147	111	75	42	14	7	8	8	3
67.5	246	245	234	212	185	151	114	77	43	14	7	8	8	3
70.0	253	252	241	218	189	155	116	78	43	14	7	8	8	3
72.5	260	258	247	223	193	158	118	79	44	14	7	8	9	3
75.0	265	264	252	228	196	161	120	80	44	14	7	8	9	3
77.5	270	269	257	232	199	163	121	81	44	14	7	8	9	3
80.0	275	273	260	235	202	165	123	81	44	14	7	8	8	3
82.5	278	276	263	238	204	166	123	81	44	14	7	8	8	3
85.0	280	279	265	240	205	167	123	81	44	13	7	8	8	3
87.5	281	280	266	241	206	167	123	81	43	13	7	8	8	2
90.0	282	281	267	241	206	167	123	81	43	13	7	8	8	3
92.5	282	281	267	241	206	167	124	81	43	13	7	8	8	3
95.0	282	281	267	241	206	168	124	82	44	13	7	8	8	3
97.5	280	279	266	240	205	167	124	82	44	14	7	8	8	3
100.0	278	276	263	238	204	167	124	82	45	14	7	8	9	3
102.5	275	273	261	236	202	166	123	82	45	14	7	8	9	3
105.0	270	269	257	232	200	164	122	82	45	14	7	8	9	3
107.5	265	264	252	228	197	162	121	81	45	14	7	8	9	3
110.0	259	258	246	223	193	159	119	80	44	14	7	8	9	3
112.5	252	252	240	218	189	155	117	79	44	14	7	8	9	3
115.0	245	244	233	211	185	151	114	77	43	14	7	8	8	3
117.5	237	236	226	205	180	147	111	76	42	13	7	7	8	3
120.0	228	227	217	198	174	143	108	74	42	13	6	7	8	3
122.5	219	219	209	191	168	138	105	72	41	13	7	7	8	4
125.0	209	209	200	183	161	132	101	70	40	13	6	7	7	4
127.5	198	199	190	175	154	127	98	67	38	12	6	7	7	4
130.0	188	188	181	167	147	121	94	65	37	12	7	7	7	4
132.5	179	178	171	158	139	115	89	62	35	12	6	7	6	4
135.0	168	167	161	150	131	109	84	58	33	11	6	6	6	4
137.5	157	156	151	140	123	102	79	55	31	10	6	6	6	4
140.0	146	145	141	130	115	96	74	52	30	10	6	6	6	4
142.5	135	134	130	121	106	89	69	48	27	10	6	6	5	4
145.0	124	124	120	111	98	82	64	44	25	9	6	5	5	4
147.5	114	113	109	102	89	75	58	41	23	8	5	5	5	3
150.0	103	103	99	92	81	68	53	37	21	8	5	5	4	3
152.5	92	92	89	83	73	61	48	33	19	7	5	4	4	3
155.0	82	81	78	73	64	54	42	29	17	6	4	4	3	3
157.5	71	71	69	64	56	48	37	26	15	6	4	4	3	2



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REPORT NUMBER: ITL81900

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ISSUE DATE: 06/27/14

PREPARED FOR: BOYD LIGHTING COMPANY

CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	112.5	135.0	157.5
160.0	61	61	59	55	48	41	32	22	12	5	3	3	3	2
162.5	51	51	49	46	40	34	26	18	10	4	3	3	2	2
165.0	42	41	40	37	33	28	21	15	8	3	3	2	2	1
167.5	32	32	31	29	26	22	16	11	6	3	2	2	2	1
170.0	22	22	21	21	19	16	12	8	5	3	2	2	1	1
172.5	14	14	14	13	11	9	7	5	3	2	1	2	1	1
175.0	8	7	7	7	6	5	4	2	2	1	1	1	1	0
177.5	2	2	2	2	2	1	1	1	1	1	1	1	1	0
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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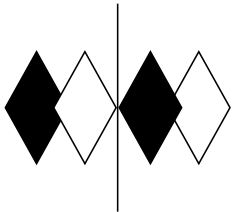
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CANDELA DISTRIBUTION
 LATERAL ANGLE

	180.0
0.0	0
2.5	1
5.0	1
7.5	1
10.0	1
12.5	1
15.0	1
17.5	2
20.0	2
22.5	2
25.0	2
27.5	2
30.0	2
32.5	2
35.0	2
37.5	2
40.0	2
42.5	2
45.0	2
47.5	1
50.0	1
52.5	1
55.0	1
57.5	1
60.0	0
62.5	0
65.0	0
67.5	0
70.0	0
72.5	0
75.0	0
77.5	0
80.0	0
82.5	0
85.0	0
87.5	0
90.0	0
92.5	0
95.0	0
97.5	0
100.0	0
102.5	0
105.0	0
107.5	0
110.0	0
112.5	0
115.0	0
117.5	0
120.0	0
122.5	0
125.0	1
127.5	1
130.0	1
132.5	1
135.0	1
137.5	1
140.0	2
142.5	2
145.0	2
147.5	2
150.0	2
152.5	2
155.0	2
157.5	2



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CANDELA DISTRIBUTION
 LATERAL ANGLE

	180.0	
160.0		1
162.5		1
165.0		1
167.5		1
170.0		1
172.5		1
175.0		0
177.5		0
180.0		0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	0
5- 10	0
10- 15	1
15- 20	3
20- 25	5
25- 30	7
30- 35	10
35- 40	14
40- 45	18
45- 50	22
50- 55	26
55- 60	30
60- 65	34
65- 70	37
70- 75	40
75- 80	43
80- 85	44
85- 90	45
90- 95	45
95-100	44
100-105	43
105-110	41
110-115	38
115-120	35
120-125	31
125-130	27
130-135	23
135-140	18
140-145	14
145-150	11
150-155	8
155-160	5
160-165	3
165-170	1
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	0
0- 20	4
0- 30	16
0- 40	40
0- 50	80
0- 60	135
0- 70	206
0- 80	289
0- 90	378
0-100	467
0-110	551
0-120	624
0-130	681
0-140	722
0-150	748
0-160	760
0-170	764
0-180	764



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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0	
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	49	
1	92	85	79	73	84	77	72	67	64	60	56	51	48	45	40	37	35	29	
2	81	71	62	55	73	64	57	50	53	47	41	42	37	33	31	28	25	20	
3	73	60	51	43	66	55	46	39	44	38	32	35	30	25	26	22	19	14	
4	66	52	42	35	59	47	39	32	38	31	26	30	25	20	22	18	15	11	
5	60	46	36	29	54	41	33	26	34	27	21	26	21	16	19	15	12	8	
6	54	40	31	24	49	37	28	22	30	23	18	23	18	14	17	13	10	6	
7	50	36	27	20	45	33	24	19	27	20	15	21	15	11	15	11	8	5	
8	46	32	23	17	42	29	21	16	24	17	13	19	14	10	14	10	7	4	
9	43	29	21	15	39	27	19	14	22	15	11	17	12	8	13	9	6	3	
10	40	27	19	13	36	24	17	12	20	14	10	16	11	7	12	8	5	3	

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

NOTE: THE ZONAL CAVITY CALCULATION TECHNIQUE IS ACCURATE WHEN LUMINAIRES WITH SYMMETRIC CANDELA DISTRIBUTIONS ARE EMPLOYED AND WHEN THE LUMINAIRES ARE LOCATED SYMMETRICALLY THROUGHOUT THE ROOM. THIS UNIT HAS SPECIAL CHARACTERISTICS AND THEREFORE THESE COEFFICIENTS SHOULD BE USED WITH CAUTION.



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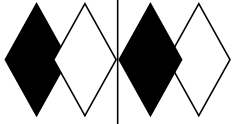
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PAGE: 9 OF 9

ADDRESS: 30 LIBERTY SHIP WAY
SUITE 3150
SAUSALITO, CA 94965

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REPORT NUMBER: ITL81899

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ISSUE DATE: 06/26/14

PREPARED FOR: BOYD LIGHTING COMPANY

CATALOG NUMBER: C46000

LUMINAIRE: FABRICATED METAL HOUSING WITH BLACK PAINTED GENERAL INTERIOR FINISH. FORMED METAL REFLECTOR WITH PREMIUM SPECULAR FINISH, FLAT DIFFUSE METAL CIRCUIT BOARD MOUNT, 2 CIRCUIT BOARDS WITH A TOTAL OF 21 LEDS, FABRICATED WHITE PAINTED METAL LENS MOUNTING BRACKETS. CLEAR FLAT 1/4" THICK GLASS LENS WITH SILVER BACKING, BACKING HAS 44 RECTANGULAR CUTOUTS MEASURING APPROXIMATELY 1/4" X 2 1/4", CUTOUTS HAVE WHITE FIBROUS INTERIOR OVERLAY, TWO FABRICATED SEMI-DIFFUSE METAL MOUNTING BRACKETS.

LAMPS: TWENTY-ONE WHITE LIGHT EMITTING DIODES (LEDS), AIMED AT THE HORIZON.

TOTAL INPUT WATTS = 23.3 AT 120.0 VOLTS

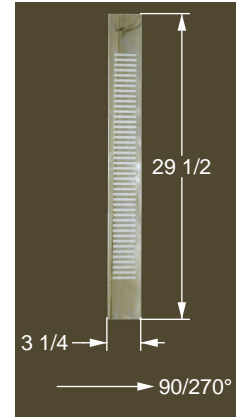
MOUNTING: WALL

LED DRIVER: OSRAM OT48W/PRG2000C/UNV/DIM/L, DRIVER HAS MULTIPLE LEADS, ONLY LINE INPUT AND LED OUTPUT LEADS CONNECTED FOR THIS TEST, CLIENT STATES DRIVER PROGRAMMED FOR 1050mA OUTPUT.

NOTE: DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED AT RATED INPUT VOLTAGE (120VAC, 60Hz) TO THE DRIVER.

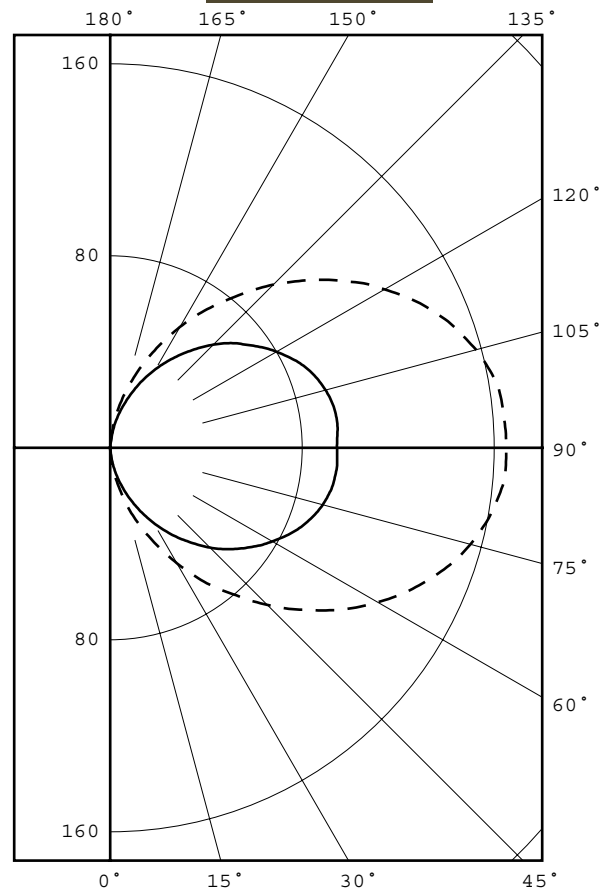
TEST PROCEDURE: IESNA LM-79-08

TEST DISTANCE = 35.0 FEET



CANDELA DISTRIBUTION

	0.0	45.0	90.0	135.0	180.0	FLUX
0	0	0	0	0	0	0
5	3	1	0	0	0	0
15	22	14	1	1	1	2
25	44	29	1	2	1	7
35	68	44	2	3	1	13
45	93	59	2	4	0	22
55	118	72	2	4	0	32
65	139	84	2	6	0	41
75	155	92	2	6	0	48
85	165	95	2	5	0	51
90	165	95	2	4	0	
95	165	95	2	5	0	51
105	158	93	2	6	0	48
115	142	86	2	6	0	42
125	121	74	2	5	0	32
135	96	61	2	4	0	23
145	71	46	2	3	1	14
155	46	30	1	2	1	7
165	23	15	1	1	1	2
175	4	2	0	0	0	0
180	0	0	0	0	0	0



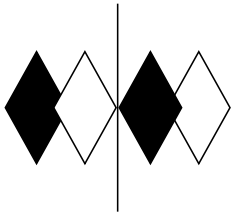
ZONAL LUMEN SUMMARY

ZONE	LUMENS	%FIXT
0- 30	9	2.0
0- 40	22	5.1
0- 60	76	17.5
0- 90	215	49.5
90-120	141	32.4
90-130	173	39.9
90-150	210	48.4
90-180	220	50.5
0-180	435	100.0

EFFICACY = 18.7 lm/W
CIE TYPE - GENERAL DIFFUSE

LEGEND:
0-deg - - - - -
45-deg = = = = =
90-deg - - - - -

Checked
Approved
Lighting Engineer



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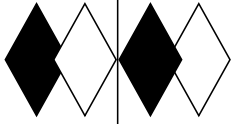
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PREPARED FOR: BOYD LIGHTING COMPANY

PAGE: 2 OF 9

PLANE : 0-DEG 90-DEG
LUMINOUS LENGTH : 0.250 3.250
HEIGHT OF SIDE : 29.500 29.500

LUMINANCE DATA IN CANDELA/SQ M

ANGLE IN DEG	AVERAGE 0-DEG	AVERAGE 45-DEG	AVERAGE 90-DEG
45	2099.	1746.	455.
55	2305.	1852.	381.
65	2470.	1948.	353.
75	2595.	2010.	359.
85	2669.	2018.	334.



REPORT NUMBER: ITL81899

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CANDELA DISTRIBUTION
LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	112.5	135.0	157.5
0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.0	3	3	3	3	2	1	1	0	0	0	0	0	0	0
7.5	8	7	7	7	6	4	3	2	1	0	0	0	0	0
10.0	13	12	12	11	10	8	6	4	2	1	1	1	1	1
12.5	17	17	16	15	13	11	8	6	3	1	1	1	1	1
15.0	22	22	21	20	17	14	11	7	4	1	1	1	1	1
17.5	28	27	26	24	21	18	14	9	5	2	1	1	1	1
20.0	33	33	31	29	26	21	17	11	6	2	1	1	1	1
22.5	38	38	36	34	30	25	19	13	7	2	1	1	2	1
25.0	44	44	42	39	34	29	22	15	9	3	1	2	2	2
27.5	49	49	47	44	39	32	25	17	10	3	1	2	2	2
30.0	56	56	53	49	44	36	28	20	11	3	2	2	2	2
32.5	62	62	59	55	48	40	31	21	12	3	2	2	3	2
35.0	68	68	65	60	53	44	34	23	13	4	2	2	3	2
37.5	74	74	71	66	58	48	37	25	15	4	2	3	3	3
40.0	80	80	77	71	63	51	39	27	16	4	2	3	4	3
42.5	86	86	83	77	67	55	42	29	17	5	2	3	4	3
45.0	93	93	89	82	72	59	45	31	18	5	2	3	4	3
47.5	99	99	95	88	76	62	48	33	19	5	2	3	4	3
50.0	105	105	101	93	81	66	50	34	19	6	2	3	4	2
52.5	111	111	107	98	85	69	52	36	20	6	2	4	4	2
55.0	118	117	112	102	89	72	54	38	21	6	2	4	4	2
57.5	123	123	118	107	93	75	56	39	22	6	2	4	5	2
60.0	129	128	123	111	97	78	58	40	22	6	2	4	5	2
62.5	134	133	128	116	101	81	60	41	23	6	2	4	6	2
65.0	139	138	132	120	104	84	62	41	23	7	2	4	6	2
67.5	144	143	136	124	107	86	63	42	24	7	2	4	6	2
70.0	148	147	140	127	110	88	65	43	24	7	2	4	6	2
72.5	152	151	144	131	112	90	66	44	24	7	2	4	6	2
75.0	155	155	147	133	114	92	67	44	24	7	2	4	6	2
77.5	158	158	150	136	116	93	68	45	24	7	2	4	6	2
80.0	161	160	152	138	117	94	68	45	25	7	2	4	6	2
82.5	163	162	154	139	118	94	69	45	24	7	2	4	6	2
85.0	165	163	155	140	119	95	69	45	24	6	2	4	5	2
87.5	165	164	156	141	119	95	69	45	24	6	2	4	5	2
90.0	165	164	156	141	119	95	68	44	24	6	2	4	4	1
92.5	165	164	156	141	119	95	69	45	24	6	1	4	4	2
95.0	165	164	156	141	119	95	69	45	24	7	2	4	5	2
97.5	164	163	155	140	119	95	69	45	24	7	2	4	6	2
100.0	163	162	154	139	118	95	69	45	25	7	2	4	6	2
102.5	161	160	152	138	117	94	69	45	25	7	2	4	6	2
105.0	158	157	150	135	116	93	68	45	25	7	2	4	6	2
107.5	154	154	147	133	114	92	67	44	25	7	2	4	6	2
110.0	151	150	143	130	112	90	66	44	25	7	2	4	6	2
112.5	147	146	140	126	110	88	64	43	24	7	2	4	6	2
115.0	142	142	135	123	107	86	63	42	24	7	2	4	6	2
117.5	137	137	131	119	104	83	61	42	23	6	2	4	6	2
120.0	132	132	126	114	100	80	59	41	23	6	2	4	5	2
122.5	127	126	121	110	96	77	58	40	22	6	2	4	5	2
125.0	121	120	115	105	92	74	56	38	22	6	2	4	5	2
127.5	115	114	109	100	87	71	53	37	21	6	2	4	4	2
130.0	109	108	104	96	83	68	51	36	20	6	2	4	4	2
132.5	102	102	98	90	78	64	49	34	19	5	2	3	4	3
135.0	96	95	92	85	74	61	46	32	18	5	2	3	4	3
137.5	90	89	86	80	69	57	43	30	17	5	2	3	4	3
140.0	83	82	80	74	65	53	40	28	16	4	2	3	4	3
142.5	77	76	74	68	60	49	38	26	15	4	2	3	3	3
145.0	71	70	68	63	55	46	35	24	14	4	2	3	3	3
147.5	64	64	62	57	50	42	32	22	13	3	2	2	3	2
150.0	58	58	56	51	45	38	29	20	12	3	2	2	2	2
152.5	52	51	50	46	40	34	26	18	10	3	1	2	2	2
155.0	46	45	44	41	36	30	23	16	9	3	1	2	2	2
157.5	40	39	38	35	31	26	20	14	8	2	1	2	2	2



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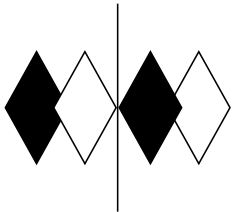
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CANDELA DISTRIBUTION
 LATERAL ANGLE

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	65.0	75.0	85.0	90.0	112.5	135.0	157.5
160.0	34	34	33	31	27	22	17	12	7	2	1	1	1	1
162.5	29	28	27	26	22	19	14	10	5	2	1	1	1	1
165.0	23	23	22	21	18	15	12	8	4	1	1	1	1	1
167.5	18	18	18	16	14	12	9	6	3	1	1	1	1	1
170.0	13	14	13	12	11	9	7	4	2	1	1	1	1	1
172.5	8	8	8	7	6	5	3	2	1	0	0	0	0	0
175.0	4	4	3	3	2	2	1	0	0	0	0	0	0	0
177.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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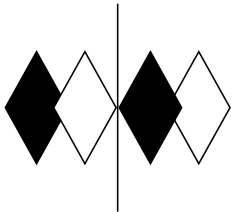
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CANDELA DISTRIBUTION
 LATERAL ANGLE

180.0	
0.0	0
2.5	0
5.0	0
7.5	0
10.0	1
12.5	1
15.0	1
17.5	1
20.0	1
22.5	1
25.0	1
27.5	2
30.0	2
32.5	2
35.0	1
37.5	1
40.0	1
42.5	1
45.0	0
47.5	0
50.0	0
52.5	0
55.0	0
57.5	0
60.0	0
62.5	0
65.0	0
67.5	0
70.0	0
72.5	0
75.0	0
77.5	0
80.0	0
82.5	0
85.0	0
87.5	0
90.0	0
92.5	0
95.0	0
97.5	0
100.0	0
102.5	0
105.0	0
107.5	0
110.0	0
112.5	0
115.0	0
117.5	0
120.0	0
122.5	0
125.0	0
127.5	0
130.0	0
132.5	0
135.0	0
137.5	0
140.0	1
142.5	1
145.0	1
147.5	2
150.0	2
152.5	1
155.0	1
157.5	1



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CANDELA DISTRIBUTION
 LATERAL ANGLE

	180.0	
160.0		1
162.5		1
165.0		1
167.5		1
170.0		1
172.5		0
175.0		0
177.5		0
180.0		0



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5-DEGREE
ZONAL LUMEN SUMMARY

0- 5	0
5- 10	0
10- 15	1
15- 20	1
20- 25	3
25- 30	4
30- 35	6
35- 40	8
40- 45	10
45- 50	12
50- 55	15
55- 60	17
60- 65	19
65- 70	21
70- 75	23
75- 80	24
80- 85	25
85- 90	26
90- 95	26
95-100	25
100-105	25
105-110	24
110-115	22
115-120	20
120-125	17
125-130	15
130-135	13
135-140	10
140-145	8
145-150	6
150-155	4
155-160	3
160-165	2
165-170	1
170-175	0
175-180	0

10-DEGREE
ZONAL LUMEN SUMMARY

0- 10	0
0- 20	2
0- 30	9
0- 40	22
0- 50	44
0- 60	76
0- 70	117
0- 80	164
0- 90	215
0-100	266
0-110	315
0-120	356
0-130	389
0-140	412
0-150	426
0-160	432
0-170	435
0-180	435



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COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

EFFECTIVE FLOOR CAVITY REFLECTANCE 0.20

RC	80				70				50			30			10			0	
	RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
0	107	107	107	107	99	99	99	99	83	83	83	69	69	69	56	56	56	50	
1	92	85	78	73	83	77	72	67	64	59	56	51	48	45	40	37	35	29	
2	81	71	62	55	73	64	57	50	52	46	41	42	37	33	31	28	25	20	
3	72	60	51	43	66	55	46	39	44	38	32	35	30	25	26	22	19	14	
4	65	52	42	35	59	47	38	32	38	31	26	30	24	20	22	18	14	10	
5	59	45	36	28	54	41	33	26	33	26	21	26	21	16	19	15	12	8	
6	54	40	31	24	49	37	28	22	30	23	18	23	18	14	17	13	10	6	
7	50	36	27	20	45	33	24	18	26	20	15	21	15	11	15	11	8	5	
8	46	32	23	17	42	29	21	16	24	17	13	19	14	10	14	10	7	4	
9	43	29	21	15	39	27	19	14	22	15	11	17	12	8	13	9	6	3	
10	40	26	18	13	36	24	17	12	20	14	10	16	11	7	12	8	5	3	

ALL CANDELA, LUMENS, LUMINANCE, AND VCP VALUES IN THIS REPORT ARE BASED ON ABSOLUTE PHOTOMETRY. THE COEFFICIENT OF UTILIZATION VALUES ARE BASED ON THE TOTAL ABSOLUTE LUMEN OUTPUT OF THIS TEST SAMPLE.

NOTE: THE ZONAL CAVITY CALCULATION TECHNIQUE IS ACCURATE WHEN LUMINAIRES WITH SYMMETRIC CANDELA DISTRIBUTIONS ARE EMPLOYED AND WHEN THE LUMINAIRES ARE LOCATED SYMMETRICALLY THROUGHOUT THE ROOM. THIS UNIT HAS SPECIAL CHARACTERISTICS AND THEREFORE THESE COEFFICIENTS SHOULD BE USED WITH CAUTION.



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